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ABSTRACT

The New Jersey Educational Assessment Program, designed to provide useful information to educational decision-makers at a variety of levels, is discussed as to a number of its characteristics. These program characteristics are: Goals--long range goals, outcome goals, and process goals; Test Development--fourth grade reading and mathematics and twelfth grade reading and mathematics; Test Administration--to all fourth and twelfth grade public school students in New Jersey; Test Results and Their Use--fourth grade mathematics test scores. Five tables provide test data for the Grade 4 mathematics test for a fictitious school district: Table 1 provides information about five items clustered under the heading "Problem Solving"; Tables 2 and 3 provide information that permits the fictitious district to compare its results to those of the state as a whole and to Local Education Agencies (LEA's) serving communities with similar socioeconomic status; Table 4 provides information about the LEA, and Table 5 represents a group of 47 districts that have a similar configuration of "hard-to-change" variables, such as SES, educational level of parents, etc. (DB)

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Individualized Instruction and Statewide Assessment: The New Jersey Educational Assessment Program*

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INTRODUCTION

The New Jersey Educational Assessment Program is designed to provide useful information to educational decision-makers who operate on a variety of levels. Demands for information come from a variety of State level and local level sources. Governor William T. Cahill in his State of the State address delivered on January 11, 1972 said:

> For although we have made significant strides in recent years toward improving the efficiency and quality of education, the State continues to experience difficulty in accurately determining the area of greatest need. We know some disparities in achievement result in inequities in the distribution of wealth from district to district but we cannot pinpoint the relationship between expenditure and achievement. In view of recent movements toward equalizing educational opportunities throughout the State, particularly in the courts, it is essential that current and accurate data be made available.
>
> I am alarmed, quite frankly, about reports of the lack of reading ability on the part of children, particularly in the urban areas; and I am concerned that there is no reliable scientific test on a Statewide basis to determine reading ability and reading growth of our youth. (Cahill, 1972).

*Paper read at American Educational Research Association convention, New Orleans, Louisiana, February 27, 1973.

The State Assembly passed a bill which mandates a testing program. The supporters of the bill expressed a need to find out where educational efforts should be concentrated. The bill which was not acted upon by the Senate, would have amended existing statute in that it required "uniform Statewide tests and examinations of achievement in reading and mathematics..." (New Jersey State Assembly, 1972).

The New Jersey Constitution gives the Legislature the responsibility of providing a proper education for the State's children. New Jersey statutes provide to the Commissioner of Education the authority, and responsibility, to determine the "thoroughness and efficiency" of education. New Jersey Statute 18A:4-24 states that:

> The commissioner shall, by direction or with the approval of the state board, whenever it is deemed to be advisable so to do, inquire into and ascertain the thoroughness and efficiency of operation of any of the schools of the public school system of the state and of any grades therein by such means, tests and examinations as to him seem proper, and he shall report to the state board the results of such inquiries and such other information with regard thereto as the state board may require or as he shall deem proper, but nothing in this section shall affect the right of each district to prescribe its own rules for promotion.

Dr. Carl L. Marburger, Commissioner of Education, provided the following introduction to a Question and Answer brochure designed to inform professional educators and the public about the Educational Assessment Program:

> This fall, New Jersey's educational system will embark on a new venture, the Educational Assessment Program. The purpose of this program

> is to assess the status of education in New Jersey relative to the statewide educational goals adopted by the State Board of Education earlier this year.
>
> We in education are being called upon to verify that the schooling provided for our students is effective and meaningful, and to demonstrate that the investment of time and financial resources results in quality education. Increasingly, the Governor and the Legislature are seeking such data as a basis for decisions concerning education. Clearly, New Jersey is faced with a mandate, exemplified by recent decisions and recommendations of the courts and the Governor's Tax Policy Committee, to develop an appropriate assessment program for our educational system in New Jersey. We not only need to know more precisely what our educational problems are across the State, but also we need insight into how to improve educational conditions and how to identify outstanding program that could be applied in other school districts. As a means of answering concerns such as these, the Educational Assessment Program has been developed by the State Department of Education. (New Jersey State Department of Education, 1972 a).

The court decision referred to by Marburger is a decision delivered by Judge Theodore I. Botter on January 19, 1972 in which he indicated that the Commissioner should exercise his power to use tests to determine educational needs.

At the same time that State level personnel were calling for additional information, local level personnel were moving toward more individualized instruction and were developing needs for individualized assessment. This movement was supported by many programs emanating from the State Department of Education. What Stufflebeam, et al, (1971) called "the problem of administrative levels" was becoming acute in New Jersey.

The Educational Assessment Program was designed to provide information on a number of levels. How this is accomplished is described below.

GOALS

The Educational Assessment Program goals which relate to State-level information needs are:

> To assess the status of the New Jersey educational system relative to the Statewide goals as determined by the State Board of Education through the "Our Schools" Project.
>
> To provide information useful in the planning and evaluation of educational programs designed to bring the New Jersey educational system closer to those Statewide goals.

The goals which relate to the needs of both State-level and local-level personnel are:

> To identify local school districts which, among others sharing similar circumstances, have conducted programs which have been most successful in achieving stated goals.
>
> To identify local school districts in need of State Department of Education assistance.
>
> To provide local school districts with information useful to their participation in the School Improvement Program.

The goals which relate to local-level information needs are:

> To provide local school districts with information useful in making decisions about the allocation of resources and the design, implementation and evaluation of educational programs.
>
> To provide local school districts with information useful in the assessment of students' progress.

The long-range goals of the Educational Assessment Program are to assess the status of New Jersey's educational system relative to the

statewide goals, which were determined by the "Our Schools" Project and adopted by the State Board of Education on April 12, 1972. The eleven "Outcome" goals pertain to individual student behaviors or attitudes desired as a result, at least in part, of formal educational experience. The nine "Process" goals describe how schools should function to provide meaningful education in New Jersey. The EAI will endeavor to provide information useful in the planning and evaluation of educational programs designed to bring the New Jersey educational system closer to these statewide goals.

The "Our Schools" goals are:

OUTCOME GOALS

The public schools in New Jersey should help every person in the State:

> To acquire basic skills in obtaining information, solving problems, thinking critically, and communicating effectively.
>
> To acquire a stock of basic information concerning the principles of the physical, biological, and social sciences; the historical record of human achievements and failures, and current social issues.
>
> To become an effective and responsible contributor to the decision-making processes of the political and other institutions of the community, state, country and world.
>
> To acquire the knowledge, skills, and understanding that permit him/her to play a satisfying and responsible role as both producer and consumer.
>
> To acquire the ability to form satisfying and responsible relationships with a wide range of other people, including but not limited to those with social and cultural characteristics different from his/her own.

To acquire the capacities for playing satisfying and responsible roles in family life.

To acquire the knowledge, habits and attitudes that promote personal and public health, both physical and mental.

To acquire the ability and the desire to express himself/herself creatively in one or more of the arts, and to appreciate the esthetic expressions of other people.

PROCESS GOALS

The public schools in New Jersey should:

Insure that all instruction bears a meaningful relationship to the present or future needs and/or interests of students.

Insure that each student has significant opportunities, consistent with his/her age, for helping to determine the nature of his/her educational experiences.

Insure that specialized and individualized kinds of educational experiences are available for meeting the particular needs of every student.

Insure that teachers and students have significant opportunities for participating in the decisions affecting the operations of the schools they work in or attend.

Provide comprehensive guidance facilities and services of high quality for every student.

Seek to structure competition among students in ways that are less harmful than present practices are.

Insure that the resources available for education are used with maximum efficiency.

Insure that instructional, administrative and support staffs are of high quality in every respect.

Develop and utilize diverse forms of constructive cooperation with parents and community groups. (New Jersey State Department of Education, 1972 b).

The Educational Assessment Program is intended to assist in identification of local school districts which have conducted programs which have been especially successful and those which are particularly in need of assistance. In addition to providing local school districts with information relevant in the assessment of students' progress, the EAP will provide information to local districts that will be helpful in making decisions about the allocation of resources and the design, implementation and evaluation of educational programs.

The Educational Assessment Program began in the fall of 1972 with the testing of fourth and twelfth grade students for achievement in the basic skills areas of reading and mathematics.

TEST DEVELOPMENT

On May 24, 1972, a State Department of Education committee met to review the proposals submitted for the Educational Assessment Program. Educational Testing Service, Princeton, New Jersey was selected as the contractor for the assessment of reading and mathematics achievement levels of New Jersey's fourth and twelfth grade public school students.

Lists of preliminary test specifications (Phase 1) were drawn up by Educational Testing Service and the Division of Curriculum and Instruction in the State Department of Education. On June 5 and 6, meetings were conducted in each of the twenty-one counties of New Jersey by the county superintendents of schools for the purpose of obtaining a statewide preliminary consensus on the specifications for each of the four achievement tests. Each school district was invited to send four representatives, one for each of the four tests. Each person was given the appropriate list of test specifications, a machine-scorable answer sheet, and a sheet for comments. Respondents rated each topic

according to the following scale:

A. Essential to be included on the test
B. Desirable to be included
C. Acceptable for inclusion
D. Inappropriate and should not be included on the test

Teachers were asked to rate topics on the basis of what is actually taught rather than on the basis of which topics they thought should be taught.

A total of 1,573 responses was received.

Rating forms and comment sheets were tabulated and reviewed by Educational Testing Service. For each topic a mean rating was computed, and the topics for each test were rank ordered.

From this information Phase 2 specifications were prepared. The fourth grade reading test specifications and the fourth grade mathematics test specifications (Phase 2) were mailed to all third grade teachers in New Jersey; Phase 2 twelfth grade reading test specifications were mailed to all high school English teachers; and Phase 2 specifications for the twelfth grade mathematics test were mailed to all high school mathematics teachers. These 11,090 teachers were asked to rate the specifications and to add comments on separate comment sheets, using procedures similar to those used at the county meetings. This material was then returned to Educational Testing Service. Approximately 7,950 responses were received.

The topics for each test were rank ordered on the basis of mean ratings. The responses of 6,375 teachers, or 57.48% of those to whom material was sent, were included in this tabulation. Some responses were excluded from the tabulation either because they were returned too late to be included or because directions for responding were not followed.

Four seven-member committees of examiners, one committee for each

of the tests, were appointed to participate in the test-development. Committee membership included teachers; administrators; representatives from the Black and Spanish-speaking communities; curriculum specialists; and, on the high school reading and mathematics committees, a high school student and a college student. Members were nominated by the Division of Curriculum and Instruction in the State Department of Education, and by key people in local districts and the state associations of mathematics teachers or of reading teachers. These committees met on four occasions during July and August, 1972. These committees reviewed test specifications, reviewed and selected items, and agreed upon format and directions.

Items to meet specifications for each of the four tests (fourth grade reading and mathematics and twelfth grade reading and mathematics) were either drawn from files of existing items or were written by the staff of Educational Testing Service.

Field testing of the first drafts of the tests was conducted on July 27, 1972. Tests were administered by Educational Assessment Program staff or by staff members of Educational Testing Service. Because of the limitations of the nature and size of the samples, results of field testing were used only to check clarity of directions and format, to estimate overall difficulty level, and to judge that groups taking the tests were reasonably comparable to groups on which items had been previously tested.

The drafts of the tests were reviewed by the Minority Groups Advisory Council. Members of this council are individuals who are familiar with tests and measurements practices or who are experienced in education of minority groups.

The Minority Groups Advisory Council met at Educational Testing Service on August 14 to review the four tests, item by item, for cultural or

linguistic bias. The Council recommended changes in some items on the fourth grade mathematics test, the fourth grade reading test, and the twelfth grade mathematics test. Most of the recommendations were rewording of items or redrawing of pictures to avoid unfavorable, stereotyped images of any minority group. The Council recommended major revisions in the twelfth grade reading test. It was the consensus of the group that paragraphs from contemporary sources should be added to this test to balance the traditional types of selections in the test.

To provide assistance in implementing recommendations, a subcommittee representative of the Minority Groups Advisory Council was formed. Since the consensus of the Council was that the subcommittee was representative of the Council as a whole, the subcommittee was authorized to act for the Council.

The subcommitee of the Minority Groups Advisory Council met with the twelfth grade reading test committee at Educational Testing Service. The group discussed each item on the twelfth grade reading test, and those items or words which were judged to be inappropriate were deleted. More appropriate words were substituted, and replacement items taken from contemporary literature were suggested.

TEST ADMINISTRATION

The tests were administered on November 14 and 15 to all fourth grade and all twelfth grade public school students in New Jersey. Practice tests were administered on November 9 in order to acquaint students with the format of the answer sheets and item types.

For schools which do not use grade designations, fourth grade students were defined as students who are in their fourth year of school beyond kindergarten,

while twelfth grade scale scores were for students who are in their twelfth year of school beyond Kindergarten or who are in their last year of high school. These students who are assigned to special education classes were excluded.

Tests were administered by classroom teachers or by other school personnel designated as test administrators by local district superintendents of schools. Training of test administrators in each district was accomplished through building coordinators who were trained by district test coordinators. Administrative aspects of the program were carried out through local district and county test coordinators. These individuals were trained at one of three area training sessions conducted by the State Department of Education and Educational Testing Service on October 11, 12, and 13, 1972.

TEST RESULTS AND THEIR USE

The following discussion deals with fourth grade mathematics test scores. The discussion is equally applicable to fourth grade reading scores and twelfth grade reading and mathematics scores.

Prior to the receipt of their test results, Local Education Agencies (LEA's) respond to a survey which lists the specifications around which the test was constructed. Examples of specifications for the fourth grade mathematics test are:

--Addition of two 2-digit numbers involving carrying.

--Addition of denominate numbers involving money.

--Addition problems, involving no carrying.

--Subtraction involving two 2-digit numbers with no borrowing.

--The student can determine which of several sums is less than 60. Sums are in the form 56 + 3, 58 + 2, etc.

--Subtraction of two 2-digit numbers involving borrowing.

--Subtraction involving two 3-digit numbers with borrowing.

Districts respond by indicating for each specification whether it is relevant to that district. Relevancy means that the district attempts to teach that specification at some time prior to the test period. The purpose of this survey is to allow the LEA's to increase the validity of the test by casting out items which measure specifications not relevant to that district. The procedure for discarding items is described below.

Because New Jersey exercises very little control over local curriculum decisions and because a uniform Statewide test is necessary, LEA's must have an opportunity to adjust their test results to compensate for differences between the LEA's curriculum and the Statewide consensus of curriculum objectives measured by the test. Although the discarding of items improves test validity, it must be remembered that LEA's are attempting many things not measured by this test or any

other single test. The LEA's are encouraged to conduct additional assessments to measure progress toward these other objectives.

THREE QUESTIONS. There are three questions which should be asked by LEA's which use either these assessment instruments or any other tests. The questions are:

1. How are the children in the LEA progressing toward the objectives of the LEA?
2. How does the progress of the children in an LEA compare to the progress of children in similar LEA's?
3. What can the LEA do to improve its educational system?

Table 1 is a representation of the NJEAP score report. This first report provides information relative to the first question.

The test results are reported item by item. The score unit is the number (and per cent) of students tested in the LEA who answered the item correctly. No traditional norm-referenced scores are produced.

Table 1 provides information about five items clustered under the heading "Problem Solving" (in reality there are more than five items in any cluster. These five are used for simplicity of discussion).

The fictitious district "Athens" indicated that four of the five specifications measured under "Problem Solving" were relevant to the LEA (Item 37 measures a specification which is not considered relevant). Approximately 81% of the 256 students tested answered Item 3 correctly. Provided with these results is a list which indicates the specification measured by Item 3. Athens now has some information about the mastery of that item. The State Department of Education does not determine mastery levels. Since local conditions determine the levels of mastery which can be expected, the LEA must decide whether 8 % is "good" or "bad".

TABLE 1

District Results

Level 4 District Athens

Subject Mathematics Number Tested 256

(1)	(2)	(3) Per Cent Achieving Item		(4)
Cluster	Item No.	Number Achieving Item	Per cent Achieving Item	Per Cent of children achieving each item determined relevant to district
Problem Solving				
Number of items in this cluster determined by this district to be relevant (NR) is 4	3	207	80.85	80.85
	9	213	83.20	83.20
	17	187	73.04	73.04
	22	78	30.46	30.46
	37	156	60.93	

AIN for Cluster Problem Solving is 66.89

Item 37, which measures a specification this LEA said is not relevant, is reported in order to provide pre-instructional test data. Item 22, which measures a relevant specification was achieved by approximately 30% of the students tested. The meaning of these results are not absolute; they are relative. Athens should inquire about the difficulty of the item, should consider when that specification was taught in relation to the test date, etc. The scores, then, are provided as guides, i.e., information to be used for decision-making, and are not to be considered extremely accurate, highly meaningful numbers. All test scores should be regarded in this way.

Column 4 lists the percentage of students who have achieved each of the relevant items. The mean of these percentages is called the Achievement Index Number (AIN) and is equal to 66.89. Athens can compute the AIN for each cluster and for all of the relevant items taken together. By itself, the AIN has little meaning. It will take on more meaning when an attempt is made to answer Question 3.

Tables 2 and 3 provide information which may be used to answer Question 2. These two tables permit Athens to compare its results to the results of the State as a whole (Table 2) and to LEA's serving communities with similar socio-economic status to Athens. Many other comparison groups will be provided. The discussion is limited to these two tables.

Table 2 has two parts. The upper level provides information about students throughout the state. The "per cent" is not an average, it is the actual percentage of students answering the item correctly. The lower level provides information on each item which reflects the percentage of students in districts which identified the item as relevant.

Table 1 and tables similar to 2 and 3 comprise the score report. The answer to Question 3 may be provided by Tables 4 and 5.

Table 4 provides information about the LEA. The variables listed here are considered modifiable, i.e., can be changed by the LEA. Table 5 represents a

TABLE 2

SUMMARY REPORT

MATHEMATICS LEVEL 4

STATE (All Districts)

Cluster	Problem Solving						Number Concepts						Numeration					
Item No.	3	9	17	22	37	C	1	6	41	32	8	10	2	19	26	44	50	C
Per cent	84	73	80	29	72	67	74	81	85	84	71	70	92	86	74	73	71	76

STATE (Items Applicable to Districts)

Cluster	Problem Solving						Number Concepts						Numeration					
Item No.	3	9	17	22	37	C	1	6	41	32	8	10	2	19	26	44	50	C
Per cent	84	79	90	57	72	72	74	81	92	85	76	71	98	87	75	82	80	79

TABLE 3

SUMMARY REPORT

MATHEMATICS LEVEL 4

MEDIAN INCOME $6,000-$7,000 (All Districts)

Cluster	Problem Solving						Number Concepts						Numeration					
Item No.	3	9	17	22	37	C	1	6	41	32	8	10	2	19	26	44	50	C
Per cent	76	57	46	42	75	59	68	80	75	71	74	67	87	86	74	63	70	74

MEDIAN INCOME $6,000-$7,000 (Items Applicable to Districts)

Cluster	Problem Solving						Number Concepts						Numeration					
Item No.	3	9	17	22	37	C	1	6	41	32	8	10	2	19	26	44	50	C
Per cent	73	64	59	47	73	61	72	81	76	76	80	72	88	84	78	65	73	75

group of 47 districts which have a similar configuration of "hard-to-change" variables such as SES, educational level of parents, etc. These variables, in general, are related to achievement to a greater degree than are the modifiable variables. Tables 4 and 5 represent an attempt to examine the importance of the modifiable variables while controlling for the "hard-to-change" variables.

Assume Athens' Achievement Index Number for the entire test was 65. Athens would enter the frequency distribution in the interval 65-69. By comparing its own data (Table 4) to information about LEA's with a similar configuration of control variables and which had AIN's approximately equal to Athens', Athens would discover that its pupil teacher ratio (31) was higher than the median of the comparable districts (27); the average years of experience for Athens' teachers was 16 compared to 12 for the other comparable districts; Athens provided more special services personnel (1.2 per 100 pupils compared to .3 per 100 pupils); Athens' per-pupil expenditure was about the same as the other comparable LEA's. In reality Table 5 would continue and provide information about all of the modifiable variables. The discussion here is limited to four variables.

LEA's are discouraged from making decisions about change on the basis of relationships between single variables and achievement. In reality, all variables interact with one another. Change in one results in change in the others. Since this program is intended to provide information for decision-makers by simulating reality, the simulation must include the interaction among all of the variables. By reading Table 5 horisontally, Athens can see itself in relation to other similar districts. By reading Table 5 vertically, Athens can begin to see the importance of each variable in predicting achievement. To provide a more accurate statement of relationships between combinations of input variables and achievement, multiple regression equations will be provided.

TABLE

District Correlates of Achievement Report

District Athens

Correlate		Value
1.	Class Size	33
2.	Student Time (day/periods)	220 min/wk.
3.	Race	W-25, N-50, P.R.-25
4.	Enrollment	17,500
5.	Teachers Experience (# of years)	(16)
6.	Age of School Building	26 years
7.	Pupil/Teacher ratio	(31)
8.	Teacher's Salaries	$13,600
9.	Teacher Experience (degree held)	A.B.-72, M.A.-25, D-3
10.	Sex	W-86, M-14
11.	Number Books in School Library	2200
12.	Ethnic/Racial Composition of District	
13.	Non-Graded Classes/ Open Classrooms	0/0
14.	Number of Graduates Entering Higher Educ.	62%
15.	Number Instructional Rooms	63
16.	Subject Offerings	
	a. Number Credits Required for All Pupils by Sub. Area	N.A.
	b. Total Number Courses Offered in Subject Area	
17.	Total Number Graduates	
18.	Number of Admn. & Supervisors	60
19.	Number of Teachers (total number)	565
20.	Special Services Personnel (total number)	(1.2/100)
21.	Non-Professional Assistance (total number)	.3/100
22.	Median Income	
23.	Per-Pupil Expenditure	($774)

TABLE 7

Correlates of Achievement Reference Table (CART) # 17

Level 4 Subject Mathematics

Achievement Index Number (AIN) From	To	Frequency	Cumulative Frequency	Median Pupil/ Teacher Ratio	Median Teacher Experience in District	Median # Special Services Personnel per 100 pupils	Median Per-Pupil Expenditure
95	100	1	47	23	17	.3	$ 1,200
90	94	3	46	26	18	1	948
85	89	2	43	22	18	.7	1,100
.		.	.	.	.	.	.
.		.	.	.	.	.	.
.		.	.	.	.	.	.
65	69	3	25	27	12	.3	786
.		.	.	.	.	.	.
.		.	.	.	.	.	.
.		.	.	.	.	.	.
0	4	1	1	29	3	.06	.674

The multiple regression equation based on information from these 47 LEA's will serve as a simulation model for Athens and the 46 other similar LEA's. Athens can "plug in" projected changes and compute projected achievement. Thus a proposed change can be "tested" prior to its implementation.

The description of the score report formats concentrated on LEA level reports. The same formats and procedures will be used to report results for school buildings, classrooms and individual students. Teachers can individualize the score reports based on the relevancy of test specifications to individual students.

In the Program's second year criterion-referenced evaluation developed and implemented on the instructional (e.g., classroom) level will begin. A teacher will then have information about individual students from the Statewide tests and information about the student from teacher-made tests. Each of these provides essential information and the assessment of student progress would be incomplete if only one system were employed.

We can no longer afford to make decisions affecting peoples lives simply by guessing the effect of those decisions -- often times after they have been implemented. As educators we all must continually seek more and better information and the ability to use it properly.

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